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Electronically Commutated Motors

Simple Fan Coil Unit with ECM Fan

Product at a glance

Electronically Commutated Motors (ECMs) allow operators to provide variable speeds to fans in fan coil applications using a tailor designed Lua4RC script. The ECM fan application is compatible with any Fan Coil application using heating and cooling modulating valves.

The PID is a control loop feedback mechanism that continuously calculates and monitors the error between a desired setpoint and the monitored value.

Solution

The SE8300 Series Room Controller is ideal for using Fan Coil units with ECMs. This offers better energy efficiency and reduces operating costs. The Room Controller allows you to capitalize on this additional energy savings by allowing you to optimise the fan control sequences of ECMs.

SE8300 Series Room Controller

Overview

The application controls a Fan Coil unit with a 0-10 VDC ECM Fan. It also has a Binary input for an Auto-Reset condensate (drain pan) float switch that disables outputs an an alarm on the Room Controller.

Lua4RC Script

The script can be used with the SE8000 Series Room Controllers for the following:

- Analog valves: 2 or 4 pipe, with or without Reheat
- Floating valve: 2 pipe only, with or without Reheat
- On/Off valve: 2 pipe only, with or without Reheat

In Fan_Mode AUTO, the Room Controller modulates the ECM fan speed based on a Cooling or Heating demand from the lowest speed up to highest speed. Both are user adjustable through the HMI.

In Fan_Mode LO, MED, HI, the Room Controller controls the ECM fan speed to simulate LO, MED or HI fan speed as configured in the LUA Parameter page.

In Dehumidification mode, the Room Controller uses the pre-defined LO speed to control the ECM Fan.

A binary input can be used for a condensate (drain pan) float switch which can be set for Normally Open or Normally Closed. This disables the Fan, Heat, and Cool outputs and displays an alarm on the Room Controller.

SE8300 Series Room Controller with ECM Features

The SE8300 ECM equipped Room Controller is optimized to offer full proportional operation versus the traditional three-speed operation. This leads to better control, increased efficiency, and a more comfortable environment. The application can be used in both BACnet IP and wireless ZigBee Pro models.

Schneider Electric
Boston ONE Campus
800 Federal Street
Andover, MA. 01810
www.schneider-electric.com

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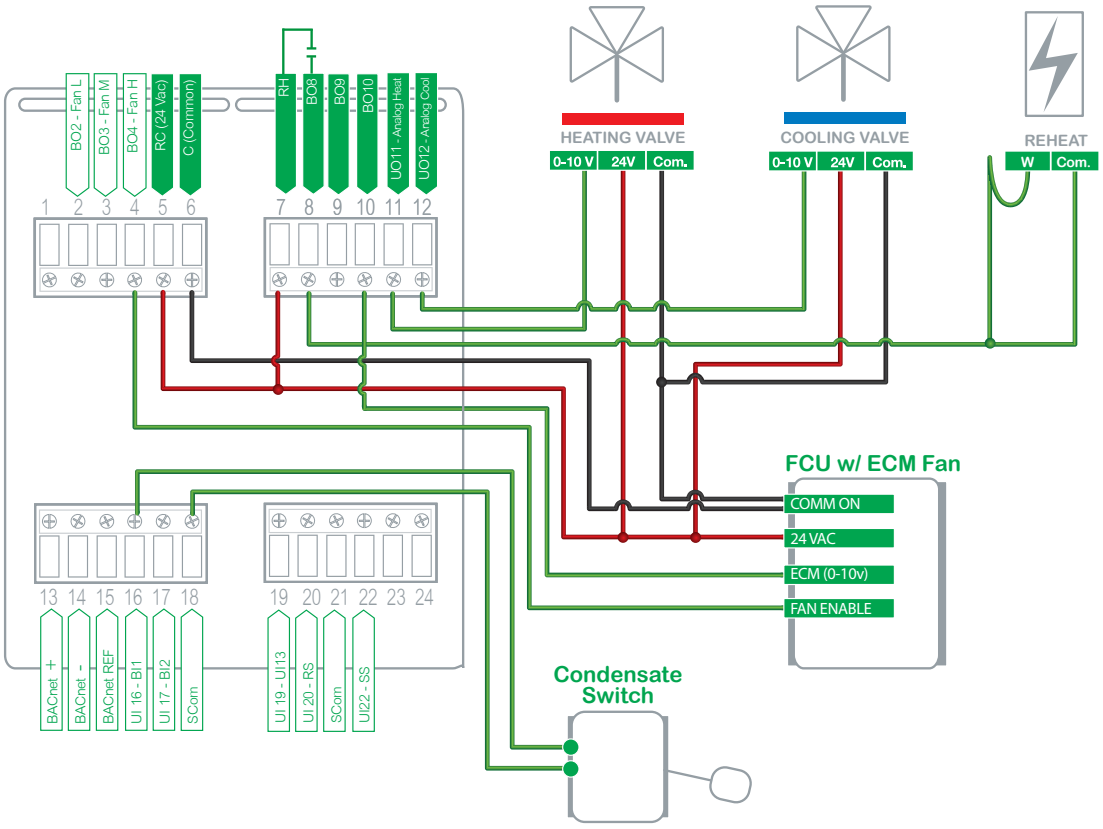
Wiring Diagram

Example

The below wiring shows a 4 pipe with or without Reheat.



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User Variables and Configuration

User Variables

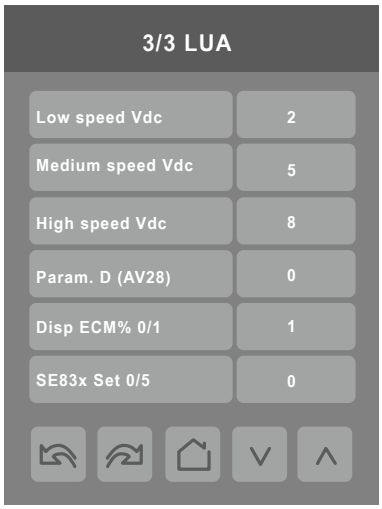
The pre-configured database provided with this application contains all the necessary objects and devices for operation. The database must be loaded using the Import Database function of Building Expert. The following steps must be taken afterwards:

In case of an SE8350 Series Room Controller (with a humidity sensor):

- If dehumidification status is ON, the Room Controller automatically sets the fan speed to low speed and the script to the set minimum voltage.
- If dehumidification status is OFF, the script runs with preset logic.

Configuration

Configuration is set in the SE8300 Series Room Controller in the Lua Programming configuration screens.



Example Variables

The table shows example variables for the Lua 3/3 screen

Variable	Name	Description
AV25	Low speed Vdc	Lowest speed & (simulated Low)(Vdc) & Dehum Ex: 2
AV26	Med speed Vdc	Simulated Medium speed (Vdc) Ex: 5
AV27	High speed Vdc	Highest speed & (simulated High) (Vdc) Ex: 8
AV28	DPan NO=0 NC=1	N/A
AV29	Disp ECM% 0/1	Set to [1] to dispaly ECM Fan %, set to [0] to clear.
AV30	SE83x0 Set 0/5	Set to [0] for SER8300, set to [5] for SER8350

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